Code No. E-10221

FACULTY OF SCIENCE

B.Sc. (CBCS) III Semester Examination, December 2022 / January 2023

Subject: Computer Science

Paper – III : Data Structure using C++

Time: 3 Hours Max. Marks: 80

PART – A

Note: Answer any eight questions. (8 x 4 = 32 Marks)

1. What do you mean by Prefix, Postfix and Infix Notations. Explain.
2. What is an Abstract Data Type? Explain.
3. What is an algorithm? Explain about Time Complexity.
4. What is a Dequeue?
5. How can we represent a linked list in memory using arrays?
6. Differentiate between Iteration and Recursion.
7. What is a Tree? List out the types of Trees.
8. What is Binary Search? Explain.
9. Sort the given list of numbers 30, 20, 10, 60, 70 using Insertion Sort.
10. How are Graphs represented? Explain.
11. What is a Heap? Build a heap for the following data: 4, 6, 1, 2, 5, 3.
12. What is a Hash Function? What are the types of Hash Functions?

PART – B

Note: Answer all the questions. (4 x 12 = 48 Marks)

13. (a) (i) What is a stack? What are the primitive operations of stack? Explain.

    (ii) List out the applications of stack.

    (OR)

    (b) (i) What is an Array? Write the advantages of Arrays?

    (ii) Explain Memory Representation and Address Calculation for one Dimensional Arrays.

14. (a) Explain representation of Queues using arrays.

    (OR)

    (b) What is a Linked List? Explain the primitive operations creating, Inserting, deleting and traversing in a linked list with examples.

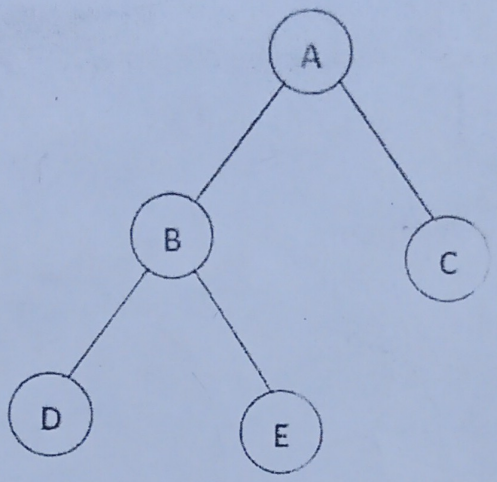
..2

15. (a) What is Quick Sort? Write an algorithm to perform Quick sort. Explain with an example.

(OR)

(b) (i) What is Traversing? Write the algorithms for preorder, inorder and postorder traversals.

(ii) What is the output after performing Preorder, inorder and postorder traversals on the following tree.



16. (a) (i) What is a Minimum Spanning Tree? Write the algorithm to find Minimum spanning tree using Kruskal's algorithm.

(ii) Write about any one of the Graph Traversal Techniques.

(OR)

(b) What is a Heap Sort? Write the steps of Heap Sort Algorithm to sort a list of elements in descending order and explain with an example.

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